the Mississippi River. This transfer of a cyclonic center across a mountain range produces the southerly curvature in the average storm track of cyclones crossing the North American Continent. The extreme southern limit reached by any track depends upon the dryness and the pressure of the air in the rear, and the turning point is usually found in the neighborhood of Lake Superior, or else in Missouri, or, even, in Texas.

XII.—This began on the 13th in eastern Kentucky and moved rapidly northeastward, reaching Halifax on the 14th, p. m., having been followed by severe northwest winds on the Atlantic coast. This was another illustration of the rapid development of small areas on the east side of the Appalachians while a high area and cold weather prevails on the west side.

XV.—This began on the 18th, a. m., when a slight depression existed in Kansas, with a high area far to the northward. The low moved southward and then east, passing Arkansas on the 19th, p. m., Tennessee on the 20th, a. m., and was found off the North Carolina coast on the 21st, a. m. Numerous heavy local rains attended this storm, and high northwest winds, followed by frosts, prevailed in the rear.

XVI.—This storm moved from the Pacific Ocean eastward into British Columbia on the 18th, 19th, and 20th. Gales, with heavy rains, prevailed in the western part of Oregon and Washington. By the 22d, a. m., the low center was in Alberta, although rain and snow continued in Washington and Oregon. During the 23d the center passed over Manitoba and on the 24th, p. m., was central on the northern border of Lake Superior, while southwest gales prevailed over the greater part of the Lake region, followed by northwest gales and snow on the 25th. This was the southernmost point in its path, and it turned northeastward on the morning of the 25th, disappearing on the 26th in Labrador.

XVII.—This area moved from Alberta to the Lower Lake region without any specially marked feature, but on the 27th, p. m., the northwest gales over Lake Huron on its western side had a temperature near the freezing point, while the southwest winds over the middle Atlantic States and Lower Lakes had temperatures of 50° or 60°, and light rain or snow had begun to fall at the region where these contrasted winds were mixing. On the 28th, a. m., the storm center was a little east of Boston, the minimum pressure at the center having fallen about 0.30 inch, heavy northwest gales were prevailing over the middle Atlantic States and heavy snow from Vermont to the coast of Maine. The center now turned northward, passing along the coast of Nova Scotia and over Newfoundland as a severe hurricane. The lowest pressure recorded was 28.78 at Sydney, C. B. I.

XVIII.—This storm, like the preceding, No. XVI, also moved northeastward toward Vancouver Island, and by the 27th, p. m., was central in British Columbia. By the 28th, p. m., the trough of low pressure extended from Alberta to Nebraska, being now on the east side of the Rocky Mountains, and the 29th, a. m., this had, as usual, closed up into a central depression representing the southern end in South Dakota. The southward movement continued until the end of the month, and by the 31st, p. m., the center was in Missouri.

NORTH ATLANTIC METEOROLOGY.

Ice.—The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported for March during the last 13 years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
	° ′	° ′		° ′	° ′
March, 1882	42 20	50 00	March, 1882	46 30	46 00
March, 1883	41 46	49 48	March, 1883	48 40	43 03
March, 1884	41 20	54 06	March, 1884	45 00	40 15
March, 1885	40 55	49 04	March, 1885	45 57	43 15
March, 1886	40 20	49 02	March, 1886	47 20	44 40
March, 1887	41 00	49 07	March, 1887	45 31	42 56
March, 1888	42 30	50 37	March, 1888	47 23	46 56
March, 1889	44 20	53 00	March, 1889	44 20	53 00
March, 1890	41 01	50 54	March, 1890	46 40	39 50
March, 1891	42 25	50 30	March, 1891	49 00	42 44
March, 1892	43 58	48 15	March, 1892	43 58	48 15
March, 1893	44 35	50 13	March, 1893	45 55	46 56
March, 1894	40 20	49 36	March, 1894	46 35	42 30
March, 1895	44 43	57 15	March, 1895	44 51	48 38
Mean	42 04	50 10	Mean	46 15	45 00

The limits of the region within which icebergs or field ice were reported for March, 1895, are shown on Chart I by crosses. The southernmost ice reported, a large field of ice noted on the 25th, was about 2½° north of the average southern limit, and the easternmost ice observed, a berg of moderate size noted on the 31st in the position given in the table, was about 4¼° west of the average eastern limit of ice for March.

Ice was reported on four dates during the current month. A great deal of slush ice, closely packed about half the time, was encountered near the coasts of Newfoundland; but the ice was thin as compared with former years. Much heavy ice was encountered in the Gulf of St. Lawrence.

Fog.—The limits of fog belts west of the fortieth meridian, as reported by shipmasters, are shown on Chart I by dotted shading. East of the fifty-fifth meridian fog was reported on 9 dates; between the fifty-fifth and sixty-fifth meridians on 5 dates, and west of the sixty-fifth meridian on 8 dates. Compared with the corresponding month of the last seven years the dates of occurrence of fog east of the fifty-fifth meridian numbered 4 more than the average; between the fifty-fifth and sixty-fifth meridians 3 less than the average; and west of the sixty-fifth meridian 3 less than the average.

TEMPERATURE OF THE AIR.

[*In degrees Fahrenheit.*]

The mean temperature is given for each station in Table II, for voluntary observers, but in Table I, for the regular stations of the Weather Bureau, both the mean temperatures and the departures from the normal are given for the current month.

The *monthly mean temperature* published in Table I, for the regular stations of the Weather Bureau, is the simple mean of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The distribution of the monthly mean temperature of the

air over the United States and Canada is shown by the dotted isotherms on Chart II; the lines are drawn over the high irregular surface of the Rocky Mountain plateau, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The *regular diurnal period* in temperature is shown by the hourly means given in Table IV for all stations having self-registers.

As compared with the normal for March, the mean temperatures for the current month were decidedly in excess in western Florida, parts of Texas, North and South Carolina, Wisconsin, Minnesota, North and South Dakota, and in a few scattered places in Washington, Oregon, and California. The greatest excesses were: Topeka, 4.7; Pierre, 3.8; Moorhead, 3.7; St. Vincent, 3.5.

Considered by districts, the mean temperatures for the current month show departures from normal temperatures as given in Table I. The greatest positive departure was North Dakota, 3.2; the greatest negative departure was for the Lower Lake region, 3.5.

The *years of highest and lowest mean temperature* for March are shown in Table I of the REVIEW for March, 1894. The mean temperature for March, 1895, was not the highest or lowest on record at any regular Weather Bureau station.

The *maximum and minimum temperatures* of the current month are given in Table I. The highest maximum was Yuma, 97; the lowest maximum, Eastport, 44. The highest minimum was Key West, 57; the lowest minimum, St. Vincent, 24.

The *years of highest maximum and lowest minimum temperatures* are given in the last four columns of Table I of the current REVIEW. During the present month the maximum temperatures were the highest on record in eastern Montana, North and South Dakota, Nebraska, Kansas, Iowa, Missouri, Arkansas, Illinois, Indiana, Ohio, Tennessee, Kentucky, northern Alabama, and Georgia. The minimum temperatures were the lowest on record at Concordia, Eureka, Astoria, and Olympia.

The *greatest daily range of temperature and the extreme monthly range* are given for each of the regular Weather Bureau stations in Table I, which also gives data from which may be computed the extreme monthly ranges for each station. The largest values among the greatest daily ranges were: Bismarck, 56; Concordia and Parkersburg, 50. The smallest values were: Tatoosh Island, 12; Key West, 13. Among the extreme monthly ranges the largest values were: Concordia, 95; Bismarck, 94; Pierre, 92; North Platte, 91. The smallest values were: Tatoosh Island, 21; Key West, 24; Nantucket, 26; Port Angeles, Fort Canby, and Port Eads, 29; San Francisco and Block Island, 30.

The *accumulated monthly departures* from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures in the third column, for comparison with the departures of current conditions of vegetation from the normal conditions.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
	°	°		°	°
North Dakota	+ 1.5	+ 0.5	New England	— 4.6	— 1.5
Northern plateau	+ 9.5	+ 3.2	Middle Atlantic	—12.0	— 4.0
North Pacific	+ 2.4	+ 0.8	South Atlantic	—14.1	— 4.7
Middle Pacific	+ 0.3	+ 0.1	Key West	— 9.5	— 3.2
Southern Pacific	+ 0.1	0.0	East Gulf	—15.0	— 5.0
			West Gulf	—12.0	— 4.2
			Ohio Valley and Tenn.	—17.0	— 5.7
			Lower Lake	—14.1	— 4.7
			Upper Lake	— 8.5	— 2.8
			Upper Mississippi	—10.3	— 3.4
			Missouri Valley	— 3.6	— 1.2
			Northern slope	— 4.8	— 1.6
			Middle slope	— 6.4	— 2.1
			Southern slope (Abilene)	—14.1	— 4.7
			Southern plateau	— 2.1	— 2.7
			Middle plateau	— 4.5	— 1.5

The *limit of freezing weather* is shown on Chart VI by the isotherm of minimum 32° and the limit of frost by the isotherm of minimum 40°.

Frosts were reported on the mornings of the 14th, 15th, and 16th, throughout the portion of California situated on the western slope of the Sierra Nevada, and especially the northern portions. In some places this frost was preceded by a hailstorm on the 13th. Great damage was done to the vegetation, especially because the warm weather of February had brought it forward more rapidly than usual. The cold wave swept over the lowland valleys in streaks, leaving certain regions uninjured at the border line where its intensity was dying out. In general, the cold air flowed down from the mountains toward San Francisco nearly parallel to the river valleys. Similar frosts occurred on the 30th in California and the 31st in Arizona. W. H. Hammon, forecast official at San Francisco, says that—

> This frost was not unexpected, and warnings were sent throughout the State. The frost was the result of a cold wave which started from Montana and the Dakotas Sunday, March 10, and which, after sweeping the entire length of California, swung around through Arizona, New Mexico, and Texas. The progress of the cold weather has been carefully watched, and every locality has been warned of its approach.

MOISTURE.

The *quantity of moisture* in the atmosphere at any time may be expressed by means of the weight contained in a cubic foot of air, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-points for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, are given in Table I.

The *rate of evaporation* from a special surface of water on muslin at any moment determines the temperature of the wet-bulb thermometer, but a properly constructed evaporometer may be made to give the *quantity of water evaporated* from a *similar surface* during any interval of time. Such an evaporometer, therefore, would sum up or integrate the effect of those influences that determine the temperature as given by the wet bulb; from this evaporation the average humidity of the air during any given interval of time may be deduced.

It is much to be desired that one or more new series of measurements of evaporation, wind velocity, temperature, and dew-point be made at high and low stations in instrument shelters similar to those used by the Weather Bureau, in order that a general empirical formula may be devised for use with the evaporometer considered as an integrating hygrometer.

The *sensible temperature* experienced by the human body and attributed to the atmosphere depends not merely upon the temperature of the air, but equally upon the dryness and the wind. It would seem that the rapid evaporation from the skin in dry, hot weather reduces the temperature of the layer of nerve cells at the surface of the body. This reduc-